

Security Analysis in Electronic Banking

An Evaluation Model of Some Turkish Banks

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Abstract—In the 1990's internet banking starting up and costumers could made banking operations online and introductions of this first new services. Security is an eternal concern for organizations. Electronic banking brings their security problems, because of its remote accessing to their information to people. In this paper, it will be given results of the interview studies and researches, which is made with some front runner banks about their electronic banking security approaches. Later on paper will be finalized with the current e-security issues, conflict and resolutions of electronic banking in Turkey.

Keywords-security; technology; electronic banking; benckmarking

I. INTRODUCTION

Electronic banking gives many advantages to banks and their costumers. According to researches one banking application cost in the branch 2.00 \$, on ATM 0, 3 \$ but in internet 0, 05 \$. According to another researches at 17 countries, in 1999 costumers' banking operations' 60% have made by online. In U.S. 7% home this has an internet connections use the internet for their banking operations at 1998 and at 1999 this ratio increased the 20%. In 2001 this number increased the 75 billion dollar, and it increased the 235 billion dollar in 2003. In 1998 the research show us at 130 finance company in 17 countries costumers' banking operations' 13% have made by online and it increased the %60 in 1999[1].

The Turkish Banking sector's development is the same as the world. Because of the competitions banks must supply the costumers' satisfactions and costumers dependences and the banks which are active in Turkey, know that the Internet banking is the most important and promising way for the costumers satisfaction. There is approximately 1, 5 million home internet users in the Turkey and approximately 180,000 home internet users use the internet banking. From these researches, both in the world and in the world and in the Turkey internet banking is promising way for the banking. Banks invest in big moneys for their internet

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banking applications. For example; in the France, the BNP Paribas Bank invest 690 million U.S. Dollar for its internet banking applications. That big amount of moneys shows us the importance of the electronic banking operations for the banks.

In future bank's invest will be more than now in the electronic banking because of the costumers' attentions.

II. SECURITY CONCEPT IN ELECTRONIC BANKING

Security is an eternal concern for organizations. Securities of the stored and transported data are the seriously focused concepts for the all organizations. Organizations always want to be sure in their commercial or information's secret's securities. In the history, people can store their important information into the restricted areas or they develop to code their important information. Electronic commerce and naturally in electronic banking brings with their security problems, because of its remote accessing to their information to people. Internet is inherently open, traditional approaches of restricting access prevented by the physical barriers now organizations still need restrict physical access to their servers. In additionally electronic banking applications is based on computers and networks, then electronic bank's servers open the attacks as same as the traditional bank's branches but there are developed many

Technologies to prevents the e-bank's servers and electronic banking application's security against the hackers.

Developed Technologies for Security of electronic banking are the followings;

- PKI and Cryptography
- Public key infrastructure (PKI)
- Cryptography
- Encryption
- Digital Certification
- Digital Signature
- Secure Socket Layer (SSL) Protocol
- Virtual Keyboard
- Firewall

Product of world leading manufactures. High availability hardware based firewalls and encrypted data storage are common features of these companies [6, 7, 8, 9, and 10].

Deciding a useful security system needs very detailed research about requirements that we want from the system. First of all the system reflects the current standards of e-security

technologies. Another criterion is the integration of security system to existing infrastructure. The system should be best of his generation. Only best or nearly best systems can provide secure environment for both technological and operational. Of course none of the modern can provide 100% secure environment. The important fact is that the clients should consider that they are using most secure systems and the banks spend much more money for security issues than before [6, 7, 8, 9, and 10]. The overall expenses can grow up from \$ 500,000 to over \$ 1.2 million. Most of the banks have integrated security departments in their own organizations. But some of them

preferred assistance for security from abroad. Number of staff that works for security can grow up to 50, but the average is 25 per organization. Up to now it has been involved about modern security issues however there still exist some attacks and user mistakes. The banks should provide internal security for against their staff. Below it can be reviewed some findings of 5 example banks based on security criteria;

TABLE I. STANDARD SECURITY SOLUTIONS OF THE BANKS

BANK	12 8bit SSL	SET	Visa 3D Secure	PKI	S-HTTP	Digital Signature	Virtual Keyboard	Time out (session)	Smart Card
BANK 1	✓		✓	✓	✓	✓	✓	✓	
BANK 2	✓		✓	✓	✓	✓	✓	✓	
BANK 3	✓	✓		✓	✓	✓	✓	✓	
BANK 3	✓	✓		✓	✓	✓	✓	✓	
BANK 4	✓	✓		✓	✓		✓	✓	

TABLE II. STANDARD SECURITY SOLUTIONS ON SERVER

BANK	Data Encryption on Server	Using Firewall	Multiple server works parallel
BANK 1	✓	✓	✓
BANK 2	✓	✓	✓
BANK 3	✓	✓	✓
BANK 4	✓	✓	
BANK 5	✓	✓	✓

TABLE III. IT SECURITY DEPARTMENT

BANKS	Separate security Department	Security Staff more than 25	Security investment more than \$ 600,000	Security service controlled from abroad	Security Politics
BANK 1	✓	✓	✓		✓
BANK 2	✓	✓	✓		✓
BANK 3	✓	✓	✓		✓
BANK 4	✓			✓	
BANK 5	✓				

TABLE IV. HACKING ACTIVITIES AND SOLUTIONS

BANKS	Daily Hacking Activities more than 1000	Working with Security Tester Company	Hacks Logging by Security Company	Hacks logging by internal Department
1.BANK	✓	✓		✓
2.BANK	✓	✓		✓
3.BANK	✓	✓		✓
4.BANK		✓	✓	
5.BANK		✓	✓	

III. CONCLUSION

Internet creates many facilities in finance sector. Bank's costumers can make all applications online it is the blessing from technology but there is a very important question. "Electronic banking is sufficiently secure?" Electronic banking brings with their security problems, because of its remote accessing to their information to people. Bank's researches shows that the there are people who not trust the electronic banking by the way they are avoided of the use the electronic banking. This researches show some of the potential of the electronic bank's costumers can be included the current electronic banking user if the banks can explain their security solutions to the people. Also it was involved that the current using

Technologies in electronic banking systems and operations under the "Security Concept in Electronic banking" title. Those technologies are primarily makes secret the data, with changing, formatting the different and unmeaning form for the unwanted people. In addition to this it was included about the some front runner bank's security approaches which are, Garanti Bankasi, HSBC Bank, Family Finans Bank, Pamukbank and Deniz Bank. It was presented these bank's security solutions. Turkish banks which we investigated use the highest technology solutions in their organizations and they are regardful on their job. All of these banks have a separated department in their organizations and approximately 25 staff works for the electronic banking security. All of these banks sensitive their security and they doesn't give any information security staff's names, except Garanti Bankasi. Bigger banks which we investigated have

security policies, and they spent between \$ 500,000 and \$ 1.2 million yearly. All of these banks trust their online banking technology and they can say easily their customer can use electronic banking without any security problem. Security problems caused from the client's carelessness, for example client doesn't use the "EXIT" button after finished their operations in the site or customers write their customer number and passwords unsafe somewhere. Another security problem is the fake sites of the original bank's site. This is the really dangerous for the electronic banking users. This malicious people copy the original e-bank site and channeled the people their site with sending the e-mail and with link in the e-mail. Than they steal their passwords. All banks get the attacks from hackers now any banks which we investigated don't meet the serious damaged attacks. They could determined the all attacks and than they have logged them. Finally; Garanti Bankasi, HSBC Bank, Family Finans Bank, Pamukbank and Deniz Bank are secure banks to use in electronic banking applications they can protect themselves and costumers from some malicious people on the internet. They trust themselves and they are working be better and developing themselves and integrated the new technologies in their security systems. For operating the secure electronic banking applications, banks made their mission carefully but electronic banking users must be more careful for the fake site of the original bank's sites and they must protect their computers with using some software like firewalls.

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